

**SOLICITATION FOR FINANCIAL  
ASSISTANCE APPLICATIONS  
NO. DE-PS26-01NT41121**



**IMPROVED RECOVERY FROM LOW-PERMEABILITY GAS  
FORMATIONS**

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**ISSUING OFFICE:**

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NATIONAL ENERGY TECHNOLOGY LABORATORY  
P. O. Box 10940**

**626 Cochrans Mill Road  
Pittsburgh, PA 15236-0940**

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Information regarding this solicitation is available on the  
Department of Energy, National Energy Technology Laboratory  
web site at:

**<http://www.netl.doe.gov/business/solicit/index.html>**

## **TABLE OF CONTENTS**

### **SECTION I -TECHNICAL REQUIREMENTS**

1.1	SUMMARY (MAR 2001) .....	<b><u>5</u></b>
1.2	BACKGROUND INFORMATION (JAN 2000) .....	<b><u>5</u></b>
1.3	SOLICITATION OBJECTIVES (MAR 2001) .....	<b><u>5</u></b>

### **SECTION II -CONDITIONS AND NOTICES**

2.1	APPLICANT ELIGIBILITY (MAY 2000) .....	<b><u>7</u></b>
2.2	NUMBER AND TYPE OF AWARDS (JAN 2000) .....	<b><u>7</u></b>
2.3	COST SHARING REQUIREMENTS (DEC 1999) .....	<b><u>7</u></b>
2.4	AVAILABILITY OF FUNDS (AUG 1999) .....	<b><u>8</u></b>
2.5	PROJECT PERIOD (AUG 2000) .....	<b><u>8</u></b>
2.6	REPORTING REQUIREMENTS (FEB 2001) .....	<b><u>8</u></b>
2.7	TIME, DATE AND PLACE APPLICATIONS ARE DUE (NOV 2000) .....	<b><u>8</u></b>
2.8	TELEGRAPHIC AND E-MAIL APPLICATIONS (SEPT 2000) .....	<b><u>9</u></b>
2.9	LATE APPLICATIONS, AMENDMENTS AND WITHDRAWALS OF APPLICATIONS (AUG 2000) .....	<b><u>9</u></b>
2.10	ANTICIPATED SELECTION AND AWARD DATES (AUG 1999) .....	<b><u>9</u></b>
2.11	CONTENT OF RESULTING AWARD (NOV 2000) .....	<b><u>9</u></b>
2.12	APPLICATION PREPARATION COSTS (DEC 1999) .....	<b><u>9</u></b>
2.13	COMMITMENT OF PUBLIC FUNDS (AUG 1999) .....	<b><u>9</u></b>
2.14	FALSE STATEMENTS (AUG 1999) .....	<b><u>10</u></b>
2.15	QUESTIONS/AMENDMENTS TO SOLICITATION (AUG 2000) .....	<b><u>10</u></b>
2.16	CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER (CFDA) (DEC 2000) ....	<b><u>10</u></b>

2.17	PARTICIPATION BY FEDERAL ORGANIZATIONS OR FEDERALLY AFFILIATED ORGANIZATIONS (MAR 2001) .....	<u>10</u>
2.18	DETERMINATION OF RESPONSIBILITY (JAN 2001) .....	<u>11</u>
2.19	APPLICATION CLARIFICATION (JULY 1999) .....	<u>11</u>
2.20	APPLICATION ACCEPTANCE PERIOD (AUG 1999) .....	<u>11</u>
2.21	AWARD WITHOUT DISCUSSIONS (AUG 2000) .....	<u>11</u>
2.22	PRESUBMISSION REVIEW AND CLEARANCES (AUG 1999) .....	<u>11</u>
2.23	LOANS NOT AVAILABLE (JULY 1999) .....	<u>11</u>
2.24	52.227-6 ROYALTY INFORMATION. (APR 1984) .....	<u>11</u>
2.25	952.227-84 NOTICE OF RIGHT TO REQUEST PATENT WAIVER. (FEB 1998) .....	<u>12</u>
2.26	NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES (AUG 1999) .....	<u>12</u>
2.27	INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM (MAR 2001) .....	<u>12</u>

### **SECTION III -APPLICATION PREPARATION INSTRUCTIONS**

3.1	APPLICATION PREPARATION INSTRUCTIONS -- GENERAL (NOV 2000) .....	<u>14</u>
3.2	OVERALL ARRANGEMENT OF APPLICATION (NOV 2000) .....	<u>14</u>
3.3	UNNECESSARILY ELABORATE APPLICATIONS (SEPT 2000) .....	<u>14</u>
3.4	VOLUME I-- APPLICATION DOCUMENTS PREPARATION INSTRUCTIONS (FEB 2001) .....	<u>15</u>
3.5	VOLUME II-- TECHNICAL APPLICATION PREPARATION INSTRUCTIONS (FEB 2001) .....	<u>15</u>
3.6	INSTRUCTIONS FOR PREPARING THE STATEMENT OF PROJECT OBJECTIVES (SEPT 2000) .....	<u>18</u>

### **SECTION IV -EVALUATION AND SELECTION**

4.1	INTRODUCTION (MAY 2000) .....	<u>20</u>
4.2	GENERAL (JULY 1999) .....	<u>20</u>
4.3	PRELIMINARY REVIEW (FEB 2001) .....	<u>20</u>
4.4	COMPREHENSIVE EVALUATION (AUG 1999) .....	<u>20</u>

4.5	TECHNICAL EVALUATION CRITERIA (AUG 1999) .....	<u>20</u>
4.6	COST EVALUATION CRITERIA (JULY 1999) .....	<u>21</u>
4.7	RELATIVE ORDER OF IMPORTANCE OF EVALUATION CRITERIA (NOV 2000) .....	<u>21</u>
4.8	APPLICATION OF PROGRAM POLICY FACTORS (NOV 2000) .....	<u>22</u>
4.9	BASIS FOR SELECTION AND AWARD (MAY 2000) .....	<u>22</u>

## **SECTION I -TECHNICAL REQUIREMENTS**

### **1.1 SUMMARY (MAR 2001)**

The Department of Energy (DOE), National Energy Technology Laboratory (NETL) is conducting this solicitation to competitively seek cost-shared applications for research and technology development efforts for improved recovery from low-permeability gas formations.

### **1.2 BACKGROUND INFORMATION (JAN 2000)**

As new discoveries from conventional supplies decline, future supplies of natural gas will have to come increasingly from low-permeability (tight) reservoirs. The National Petroleum Council's (NPC) 1992 natural gas study concluded that 232 Tcf of gas could be technically recoverable from low-permeability formations, and assuming that technology improvements continued, the NPC estimated that 349 Tcf of gas could be produced. In their most recent study (1999), the NPC states that deeper resources, resources in deeper water, and nonconventional resources will be the key to future supply. However, under current limitations in exploration and production technology, only a small portion of this vast resource is economic to develop.

A significant portion of natural gas resources in low-permeability formations are found in deep reservoirs and in large gross intervals (over thousands of feet) with many potential pay zones. In addition, most low-permeability wells are marginally productive because an extensive, well-connected natural fracture network is the exception, rather than the rule. These factors indicate that improved recovery technology and reduced costs associated with completion will increase recovery from this vital resource.

Although the high ultimate recovery from wells associated with large natural fractures systems are the exception, these wells can produce 5-10 Bcf. However, these wells often have problems associated with high water production because the natural fracture system connects to overlying or underlying water zones or because they are associated with a fault(s) that provides a pathway for large water influx.

### **1.3 SOLICITATION OBJECTIVES (MAR 2001)**

#### **Objective**

The objective of this program solicitation is to demonstrate existing technologies and methodologies, or improve and demonstrate technologies with strong near-term commercialization potential, for increasing production from low-permeability "tight" gas formations. Demonstrations of existing technologies should be relatively new to a basin or play.

Note: DOE does not have a program in coalbed methane and will not accept proposals for R&D in coalbed methane.

#### **SCOPE**

Applications will only be accepted for research and development (R&D) in two major areas: (1) improved completion technology; and (2) identification/remediation of high water production problems from basin-centered gas plays.

Area (1), Improved completion technology - DOE is seeking demonstrations in new wells of opportunity and will not accept for applications recompletion or restimulation in existing wells.

Area (2), Identification/remediation of high water production problems from basin-centered gas plays - DOE will accept applications for recompletions in existing wells if the recompletion is to remediate high water production problems.

A good validation plan should include comparison with existing completion costs and production data. Demonstrations of existing technologies should be relatively new to a basin or play. For the purposes of this solicitation, DOE considers research in the following basins and plays to be of higher priority, however, this does not preclude research in the other basin or plays:

Greater Green River	Wind River	Anadarko
Permian	San Juan	Piceance
Uinta	Arkla-E.Texas	

Increasing reserves per well with better completion technology or reducing the cost to complete a well will vastly improve the recovery from marginally economic wells. Applications for improved completions can include (but will not be limited to):

- Cementing
- Downhole separation/reinjection
- Stimulation techniques
  - compatible fluids
  - composite fracturing plugs/baffles
  - zonal isolation
- Improved identification of most productive intervals
- Tubulars (CO<sub>2</sub>/H<sub>2</sub>S)
- Multi-lateral horizontal wells
- Multiple stimulations from a horizontal well

By identifying the sources and mechanisms of high water production, industry can avoid these areas or complete the reservoir in a way that reduces or eliminates excessive water production. Applications for identification/remediation of high water production problems from basin-centered gas plays can include:

- Regional hydrologic study
- Water sampling and analysis
- New/improved geophysical well log(s) and/or processing
- Improved downhole fluid identification

## **SECTION II -CONDITIONS AND NOTICES**

### **2.1 APPLICANT ELIGIBILITY (MAY 2000)**

Any non-profit or for-profit organization, university or other institution of higher education, or non-federal agency or entity is eligible to apply, unless otherwise restricted by the Simpson-Craig Amendment.

Organizations which are described in section 501(c)(4) of the Internal Revenue Code of 1986 and engage in lobbying activities after December 31, 1995, shall not be eligible for the receipt of Federal Funds constituting an award, grant, or loan. Section 501(c)(4) of the Internal Revenue Code of 1986 covers:

“Civic leagues or organizations not organized for profit but operated exclusively for the promotion of social welfare, or local associations of employees, the membership of which is limited to the employees of a designated person or persons in a particular municipality, and the net earnings of which are devoted exclusively to charitable, educational or recreational purposes.”

Lobbying activities are defined broadly to include, among other things, contacts on behalf of an organization with specified employees of the Executive Branch and Congress with regard to Federal legislative, regulatory and program administrative matters.

Applicants that are seeking financial assistance under this solicitation, are subject to the eligibility requirements of Section 2306 of the Energy Policy Act of 1992 (EPA).

In accordance with 10 CFR 600.502, a company shall be eligible to receive an award of financial assistance under a covered program only if DOE finds that--

(a) Consistent with Sec. 600.503, the company's participation in a covered program would be in the economic interest of the United States; and

(b) The company is either--

(1) A United States-owned company; or

(2) Incorporated or organized under the laws of any State and has a parent company which is incorporated or organized under the laws of a country which--

(i) Affords to the United States-owned companies opportunities, comparable to those afforded to any other company, to participate in any joint venture similar to those authorized under the Act;

(ii) Affords to United States-owned companies local investment opportunities comparable to those afforded to any other company; and

(iii) Affords adequate and effective protection for the intellectual property rights of United States-owned companies.

### **2.2 NUMBER AND TYPE OF AWARDS (JAN 2000)**

It is anticipated that there will be multiple awards resulting from this solicitation. However, the Government reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this solicitation and will award that number of financial assistance instruments which serves the public purpose and is in the best interest of the Government. The Government intends to use Cooperative Agreements as the type of award instrument(s).

### **2.3 COST SHARING REQUIREMENTS (DEC 1999)**

In accordance with 10 CFR 600.30, the DOE has determined that a minimum cost share for this project is 20%. However, for those technologies that are existing or near commercialization, a cost share of 50% or more is expected since the risk associated with a demonstration is reduced. The cost share requirement is based on a percentage of the total award value, and not as a percentage of the government's share. Cost sharing must meet the requirements of 10 CFR 600.123 and 10 CFR 600.224. Allowable costs for cost sharing shall be in accordance with 10 CFR 600.127 and 10 CFR 600.222. The

DOE will fund only the costs of the technology being tested, including the project management and engineering associated with this testing. Drilling costs, completion costs indirectly related to the technology being tested, and costs associated with existing data (data must be verifiable from recipient's records and necessary and reasonable to accomplish project objectives) shall be prorated at 10% and can be included as part of the cost share requirement. The remaining 90% shall be considered in-kind contributions but shall not be considered part of the project costs or cost share requirement.

## **2.4 AVAILABILITY OF FUNDS (AUG 1999)**

At current planning levels, and subject to the availability of funds, DOE expects to provide up to approximately \$2,000,000 over three years to support work under this solicitation.

## **2.5 PROJECT PERIOD (AUG 2000)**

The Government anticipates the project period for the subject awards to range in duration from 12 to 36 months. Awards will have project and budget periods that are specific to the project and funding.

## **2.6 REPORTING REQUIREMENTS (FEB 2001)**

The Reporting Requirements identified in the model financial assistance agreement located at <http://www.netl.doe.gov/business/faapiaf/MODEL.PDF> are required to be submitted during performance of the award.

In addition to the standard reports identified in the model, the following reports will be incorporated in the resultant award.

- Quarterly Federal Assistance Milestone Plan;
- Quarterly Milestone Log;
- Quarterly Federal Assistance Management Summary Report;
- Quarterly Federal Assistance Program/Project Status Report;
- Yearly Technical Progress Report; and,
- Monthly Electronic Status Report (a 1-3 page summary of past work, accomplishments, next months planned work and issues/concerns).

Note: Submission of the SF 270, Request for Advance or Reimbursement, shall include, as an attachment, supporting data justifying the requested funds.

## **2.7 TIME, DATE AND PLACE APPLICATIONS ARE DUE (NOV 2000)**

Applications shall be submitted in paper media in sealed envelopes or packages addressed to the office and point of contact specified below:

APPLICATIONS MUST BE RECEIVED AT THE FOLLOWING MAILING ADDRESS NO LATER THAN MAY 16, 2001, 4:00 P.M. EST.

U. S. Department of Energy  
National Energy Technology Laboratory  
P. O. Box 10940, MS 921-107  
626 Cochran's Mill Road  
Pittsburgh, PA 15236-0940

Point of Contact :	Dona Sheehan
Telephone Number:	412/386-5918
Fax Number:	412/386-6137
E-Mail Address:	sheehan@netl.doe.gov
Contracting Officer:	Mary C. Gabriele

## EXTERNAL MARKING OF APPLICATIONS

Applications shall be marked with the following information:

- (1) Address of Proposer
- (2) Solicitation Number
- (3) Due Time and Date of Applications
- (4) Point of Contact at Issuing Office

### **2.8 TELEGRAPHIC AND E-MAIL APPLICATIONS (SEPT 2000)**

Telegraphic and E-mail applications will NOT be considered. The term "Telegraphic" includes both mailgrams and facsimile submissions.

### **2.9 LATE APPLICATIONS, AMENDMENTS AND WITHDRAWALS OF APPLICATIONS (AUG 2000)**

An application or amendment of an application shall be timely if it is received at the location on or before any of the deadline dates and times specified in this section.

Applications or amendments of applications may be withdrawn by written notice at any time before award. Written notice includes E-mails and facsimiles. An authorized representative may withdraw applications in person, if the representative's identity is made known and the representative signs a receipt for the application before award. Applications will not be returned unless they are timely withdrawn.

### **2.10 ANTICIPATED SELECTION AND AWARD DATES (AUG 1999)**

It is anticipated that selection and awards will be made in the government's Fiscal Year 2001.

### **2.11 CONTENT OF RESULTING AWARD (NOV 2000)**

Any agreement awarded as a result of this solicitation will contain the applicable terms and conditions found in the Model Financial Assistance Agreement located at the NETL Website located at:

<http://www.netl.doe.gov/business/faapiaf/MODEL.PDF>

Blank areas appearing in the model agreement indicated by "[ ]" will be completed after negotiations.

### **2.12 APPLICATION PREPARATION COSTS (DEC 1999)**

This solicitation does not obligate the Government to pay any costs incurred in the preparation and submission of applications, or in making necessary studies or designs for the preparation thereof or to acquire, or contract for any services.

### **2.13 COMMITMENT OF PUBLIC FUNDS (AUG 1999)**

The Contracting Officer is the only individual who can legally commit the Government to the expenditure of public funds in connection with the proposed award. Any other commitment, either explicit or implied, is invalid.

## **2.14 FALSE STATEMENTS (AUG 1999)**

Applications must set forth full, accurate, and complete information as required by this solicitation. The penalty for making false statements in applications is prescribed in 18 U.S.C. 1001.

## **2.15 QUESTIONS/AMENDMENTS TO SOLICITATION (AUG 2000)**

All requests for explanation or interpretation of any part of the solicitation shall be submitted in writing and must be received by the Contract Specialist via E-mail or in writing not later than 4:00 p.m. local prevailing time on April 18, 2001. The Government reserves the right not to respond to questions submitted after this date, nor to respond to questions submitted by telephone or in person at any time.

The only method by which any term of this solicitation may be amended is by an express, formal amendment generated by the issuing office. No other communication, whether written or oral will amend or supersede the terms of this solicitation.

Amendments to the solicitation will be posted on NETL's website @ <http://www.netl.doe.gov/business/solicit/>. Applicants are encouraged to periodically check the NETL Homepage to ascertain the status of any amendments as hard copies will not be distributed.

## **2.16 CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER (CFDA) (DEC 2000)**

81.089 Fossil Energy Research and Development. The Applicant should put this CFDA number in Block 10 of the Standard Form 424, Application for Federal Assistance.

## **2.17 PARTICIPATION BY FEDERAL ORGANIZATIONS OR FEDERALLY AFFILIATED ORGANIZATIONS (MAR 2001)**

Applications submitted by, or on behalf of: (1) another Federal agency; (2) a Federally Funded Research and Development Center (FFRDC), or (3) a Department of Energy (DOE) Management and Operating (M&O) contractor will not be eligible for an award under this solicitation. However, these organizations may be proposed as team members subject to the following guidelines.

(a) For DOE M&O contractors, the proposed use of such entity must be authorized in writing by the DOE Contracting Officer or authorized designee responsible for managing the M&O Contractor, and the applicant must provide the additional information identified in VOLUME I - APPLICATION DOCUMENTS found at the NETL Website located at [www.netl.doe.gov/business/faapiaf/main.html](http://www.netl.doe.gov/business/faapiaf/main.html). The DOE Contracting Officer responsible for managing the M&O Contractor must determine that performance by the M&O contractor: (1) is consistent with or complementary to DOE missions and the missions of the facility to which the work is to be assigned; (2) will not adversely impact execution of assigned programs of the facility; (3) will not place the facility in direct competition with the domestic private sector; and (4) will not create a detrimental future burden on DOE resources. DOE will make award to the applicant for the applicant's portion of the effort. For the M&O effort, DOE shall fund the work, in whole or in part, through a DOE field work proposal to the M&O contractor. If DOE funds a portion of the M&O effort, then the Recipient is responsible for funding the remaining portion of the effort through a Cooperative Research & Development Agreement (CRADA) or a service agreement utilizing their own funds.

(b) For FFRDC contractors (other than a DOE M&O contractor), the proposed use of such entity must be consistent with the FFRDC's authority under its contract with the cognizant Federal agency and such work must not place the FFRDC in direct competition with the private sector. DOE shall fund the FFRDC work through an interagency agreement with the cognizant Federal agency.

(c) For other Federal Agencies, the proposed effort must not place the agency in direct competition with the private sector. DOE shall fund the other agency work through an interagency agreement.

(d) An applicant's cost sharing requirement shall be based on the total cost of the project, including the applicant's and the Federal Agency, FFRDC and M&O's portions of the effort.

(e) The estimated total cost of the Federal Agency, FFRDC or M&O contractor(s) work, in the aggregate, shall not exceed ten (10) percent of the total estimated project cost.

#### **2.18 DETERMINATION OF RESPONSIBILITY (JAN 2001)**

DOE will evaluate the potential Recipient's responsibility before award. Responsibility determinations are focused on the Recipient's capability to manage and account for the funds, property and other assets provided and to perform satisfactorily under the terms of the award. If a potential Recipient is determined to not be in compliance or cannot or will not comply with generally applicable requirements (see 10 CFR Part 600, Appendix A), the contracting officer will find the Recipient not responsible and may either disapprove the application or use special restrictive conditions as a term of award.

#### **2.19 APPLICATION CLARIFICATION (JULY 1999)**

DOE reserves the right to require applications to be clarified or supplemented to the extent considered necessary either through additional written submissions or oral presentations.

#### **2.20 APPLICATION ACCEPTANCE PERIOD (AUG 1999)**

The minimum application acceptance period shall be 180 calendar days after the deadline for receipt of applications.

#### **2.21 AWARD WITHOUT DISCUSSIONS (AUG 2000)**

Notice is given that award may be made after few or no exchanges, discussions or negotiations. Therefore, all applicants are advised to submit their most favorable application to the Government. The Government reserves the right, without qualification, to reject any or all applications received in response to this solicitation and to select any application, in whole or in part, as a basis for negotiation and or award.

#### **2.22 PRESUBMISSION REVIEW AND CLEARANCES (AUG 1999)**

Presubmission review under Executive Order 12372, "Intergovernmental Review of Federal Programs" is not required.

#### **2.23 LOANS NOT AVAILABLE (JULY 1999)**

Loans are not available under the DOE Minority Economic Impact (MEI) loan program, 10 CFR Part 800, to finance the cost of preparing a financial assistance application.

#### **2.24 52.227-6 ROYALTY INFORMATION. (APR 1984)**

(a) Cost or charges for royalties. When the response to this solicitation contains costs or charges for royalties totaling more than \$250, the following information shall be included in the response relating to each separate item of royalty or license fee:

(1) Name and address of licensor.

(2) Date of license agreement.

(3) Patent numbers, patent application serial numbers, or other basis on which the royalty is payable.

(4) Brief description, including any part or model numbers of each contract item or component on which the royalty is payable.

(5) Percentage or dollar rate of royalty per unit.

(6) Unit price of contract item.

(7) Number of units.

(8) Total dollar amount of royalties.

(b) Copies of current licenses. In addition, if specifically requested by the Contracting Officer before execution of the contract, the recipient shall furnish a copy of the current license agreement and an identification of applicable claims of specific patents.

## **2.25 952.227-84 NOTICE OF RIGHT TO REQUEST PATENT WAIVER. (FEB 1998)**

Recipients have the right to request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of the contract that may be awarded as a result of this solicitation, in advance of or within 30 days after the effective date of contracting. Even where such advance waiver is not requested or the request is denied, the contractor will have a continuing right under the contract to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the contract. Domestic small businesses and domestic nonprofit organizations normally will receive the patent rights clause at DEAR 952.227-11 which permits the contractor to retain title to such inventions, except under contracts for management or operation of a Government-owned research and development facility or under contracts involving exceptional circumstances or intelligence activities. Therefore, small businesses and nonprofit organizations normally need not request a waiver. See the patent rights clause in the draft contract in this solicitation. See DOE's patent waiver regulations at 10 CFR part 784.

## **2.26 NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES (AUG 1999)**

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

## **2.27 INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM (MAR 2001)**

### **(a) PATENT RIGHTS**

The government will have certain rights in all subject inventions. A subject invention is one which is conceived or first actually reduced to practice under a DOE award. This may include inventions that have been patented prior to the award of the contract, if the invention is first actually reduced to practice under the contract. The statutes defining the government's rights are found at 35 U.S.C. §§ 200 to 212, <http://www4.law.cornell.edu/uscode/> and the regulations are found at 10 CFR 927.3 <http://www.access.gpo.gov/nara/cfr/index.html>. The following is a general discussion, which is not exhaustive and so should not be relied on as legal advice. Review the statutes and regulations referenced above, and the clauses referenced below for a more complete explanation.

If the contractor or subcontractor is a domestic small business firm or non-profit organization, the clause at 48 CFR 952.227-11 applies. Under this clause, the contractor will have the first option to elect to retain title to any subject invention. However, the government retains certain rights such as march-in rights, U.S. preference, and government-use license.

If the contractor or subcontractor does not qualify as a domestic small business firm or non-profit organization, the clause at 48 CFR 952.227-13 applies. Under this clause, the government takes title to any subject invention and the contractor gets

a revocable, nonexclusive, royalty free license. However, the contractor can petition the Department of Energy (DOE) for a waiver of patent rights. A minimum of 20% cost sharing is usually required for an advance patent waiver, and the DOE retains some rights in the invention such as march-in rights, US competitiveness, and government use license. The DOE waiver regulations are found at 10 CFR 784.

**(b)RIGHTS TO TECHNICAL DATA**

Pursuant to 48CFR 52.227-14 and 52.227-16, the Government has unlimited rights in technical data created under the agreement. Delivery or licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement or as may be negotiated as a condition of a patent waiver to insure continued development toward commercialization of an invention arising under a DOE agreement.

### **SECTION III -APPLICATION PREPARATION INSTRUCTIONS**

#### **3.1 APPLICATION PREPARATION INSTRUCTIONS -- GENERAL (NOV 2000)**

The application shall be prepared as set forth herein to provide a standard basis for evaluation and to insure that each application will be uniform as to format and sequence. Applications shall be prepared in accordance with this section and the instructions found at the NETL Website located at:

<http://www.netl.doe.gov/business/faapiaf/main.html>

To aid in evaluation, applications shall be clearly and concisely written as well as being neat, indexed (cross-indexed as appropriate) and logically assembled. All pages of each volume shall be appropriately numbered and identified with the name of the applicant, the date and the solicitation number to the extent practicable. Each volume is a stand alone document, therefore, some information provided may need to be included in all volumes. ***The Technical Application shall not exceed 50 pages (excluding attachments identified on page 16). The text shall be typed, double spaced, using 12 point font, and printed, unredacted on 8 ½ by 11-inch paper. The application shall contain only single-sided pages.***

Each application should clearly demonstrate the applicant's capability, knowledge, and experience in regard to the requirements described herein. Failure to respond or follow the instructions regarding the organization and content of the application may result in the application being deemed unacceptable.

During the review of a complete application, DOE may request the submission of additional information if the information is essential to evaluate the application.

#### **3.2 OVERALL ARRANGEMENT OF APPLICATION (NOV 2000)**

The overall application shall consist of three (3) physically separated volumes, individually entitled as stated below. Submit the required number of each application volume shown in the matrix below.

VOLUME	ORIGINAL	NUMBER OF COPIES	PAGE LIMITATION
Volume I -- Application Documents	1	3	None
Volume II -- Technical Application	1	6	50
Volume III -- Cost Application	1	3	None

ALL FORMS AND INSTRUCTIONS NEEDED FOR PREPARATION OF EACH VOLUME ARE FOUND ON THE NETL HOMEPAGE AT:

<http://www.fetc.doe.gov/business/faapiaf/main.html>

PLEASE NOTE THAT ALL FORMS WERE DEVELOPED USING WORDPERFECT 6.1 AND FORMATTED FOR PRINTING USING A HP LASERJET IIISi PRINTER. INSTRUCTIONS FOR COMPLETION OF THE FORMS ARE CONTAINED ON THE BACK OF EACH FORM. QUESTIONS ON COMPLETION OF THE FORMS SHOULD BE ADDRESSED TO THE CONTRACT SPECIALIST.

#### **3.3 UNNECESSARILY ELABORATE APPLICATIONS (SEPT 2000)**

Unnecessarily elaborate applications beyond those sufficient to present a complete and effective response to this solicitation are not desired. Elaborate art work and expensive visual presentations are neither necessary nor wanted.

### **3.4 VOLUME I-- APPLICATION DOCUMENTS PREPARATION INSTRUCTIONS (FEB 2001)**

Application documents and preparation instructions can be found on the NETL home page at <http://www.netl.doe.gov/business/faapiaf/main.html>. No additional project specific information is required.

### **3.5 VOLUME II-- TECHNICAL APPLICATION PREPARATION INSTRUCTIONS (FEB 2001)**

The technical application shall not exceed fifty (50) pages. The text shall be typed, double spaced, using 12 point font, and printed, unreduced on 8 ½ by 11-inch paper. The application shall contain only single-sided pages. The format for the Technical Application can be found on the NETL Website at:

<http://www.netl.doe.gov/business/faapiaf/main.html>

In order to produce a comprehensive application for this solicitation, the “Technical Discussion” section of the technical application should address, at a minimum, the areas listed below. To help facilitate the review process and to insure addressing all the review criteria, the applicant shall use this format when preparing the technical application. This format relates to the technical evaluation criteria found in Section IV.

#### **1. GENERAL**

The technical application should provide a detailed description of the work that is being proposed, how the work is to be carried out, and how the results will benefit the natural gas industry. The technical information contained in this section will be evaluated to determine such matters as the applicant’s understanding of the work to be performed, the soundness of the technical approach, and potential for completing the desired work.

**In order that the Technical Application may be evaluated strictly on the merit of the material submitted, no cost information is to be included in the Technical Application.** Where estimated man-hours will provide clarity, they shall be quoted in man-hour figures only, with no indication as to the cost of these man-hours.

*The Technical Application shall not exceed 50 pages.* No material may be incorporated in any application by reference as a means to circumvent the page limitation. Pages in excess of the technical application page limitation identified will be excluded from evaluation.

The Statement of Project Objectives, resumes, additional pertinent publications, and letters of commitment are to be attachments to the Technical Application and will not be included in the page limitation.

#### **2. FORMAT AND CONTENT**

Volume II - Technical Application is to be composed of the following elements in the order designated below:

(A) Cover Sheet. A completed cover sheet as per the format specified on the NETL Website above, shall be used. The title of the proposed effort should be concise and descriptive of the work to be performed.

(B) Public Abstract. This section shall contain a public abstract as defined in the format contained on the NETL Website above. Unlike all other sections of the Technical Application, *the Abstract can be single-spaced*. The Applicant shall provide a point of contact for coordination, preparation, and distribution of press releases.

(C) Table of Contents. In order to produce a comprehensive application for this solicitation, the Applicant should address, at a minimum, the areas listed below. To help facilitate the review process and to insure addressing all the review criteria, the Applicant shall use the following Table of Contents.

## TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT .....	i
Table of Contents .....	ii
List of Tables .....	iii
List of Figures .....	iv
List of Acronyms .....	v
TECHNICAL DISCUSSION	
1. SCIENTIFIC AND TECHNICAL MERIT	
1.1 Project Objectives and Rationale .....	#
1.2 Description/Discussion of Technology/Methodology .....	#
1.3 Scientific/Engineering Soundness of Techonolgy .....	#
1.4 Need for Technology .....	#
1.5 Current Status of Technology .....	#
1.6 Potential for Scientific or Technical Breakthrough .....	#
1.7 Technical Barriers .....	#
2. PROJECT PLAN/TECHNICAL APPROACH	
2.1 Detailed Discussion of Planned Work .....	#
2.2 Project Site Description .....	#
2.3 Project Schedule and Milestones .....	#
2.4 Labor Hours and Justification .....	#
2.5 Proposed Travel .....	#
2.6 Potential Problems and Mitigation .....	#
2.7 Technology Transfer Plan .....	#
3. MERIT OF THE TECHNOLOGY .....	
3.1 Performance Improvements and Cost Savings Over Existing Technology .....	#
3.2 Cost/Benefit Analysis .....	#
3.3 Potential for Commercialization .....	#
4. PERSONNEL QUALIFICATIONS, PROJECT ORGANIZATION AND EXPERIENCE, FACILITIES AND EQUIPMENT	
4.1 Qualifications of Key Organizations .....	#
4.2 Qualifications of Key Personnel .....	#
4.3 Project Organizational Structure .....	#
4.4 Relevant Project Experience .....	#
4.5 Quality and Suitability of Facilities, Equipment, and Materials .....	#
TECHNICAL EXCEPTIONS AND DEVIATIONS .....	#
APPENDICES	
A. STATEMENT OF PROJECT OBJECTIVES .....	A1
B. RESUMES .....	B1
C. ADDITIONAL PERTINENT PUBLICATIONS (if any) .....	C1
D. LETTERS OF COMMITMENT (if any) .....	D1

(D) Technical Discussion. This section shall contain the major portion of the Technical Application. It shall be presented in as much detail as practical and include, the following technical information:

### 1. Scientific and Technical Merit (Criterion 1)

The applicant shall provide a clear description of all project objectives and briefly discuss how the technical approach will achieve these objectives. The applicant shall clearly describe and discuss the technology which is to be developed or

demonstrated. This section shall describe the necessary scientific and engineering principles to demonstrate both the soundness of the technology and the applicant's technical approach. The discussion shall identify the need for the technology, the current status of this technology or similar technologies, state of the art/practice in that basin, any background information, and the potential for success from an engineering/scientific viewpoint. For projects in which substantial work and experimentation has already been completed, the applicant should describe how the proposed work comprises the next logical steps in the research and development of the proposed technology. Technical barriers shall be identified and the approach to overcome these barriers should be discussed. The applicant must clearly indicate which topic area the research will focus on: 1.) completion; 2.) water identification/remediation or 3.) R&D that will benefit both.

## **2. Project Plan/Technical Approach (Criterion 2)**

This section shall clearly describe how the proposed work is to be accomplished. The recipient shall provide the project objectives, a detailed description of the work to be performed in the Statement of Project Objectives (SPO), the need for the individual tasks and subtasks, a project schedule/milestone chart, a table estimating labor hours and labor categories, and a description of any required travel.

The SPO shall divide the work into logical tasks and subtasks necessary to accomplish the project objective(s), provide a clear description of the work to be performed under each task, and clearly identify the organization(s) responsible for completion of the work. The description here should be an expanded version of the tasks to be performed in Appendix A and discuss why (from a technical view) the work is necessary. This section should also identify the interrelationship of each task or subtask and the resulting deliverable or product (if any) from each task/subtask. The project plan shall clearly identify the location(s)/site(s) where the work is to be performed and provide any relevant geologic and engineering data, including maps and production data, to support the rationale for demonstrating the technology at that site. Letters of commitment from industry partner(s) that are participating in the project shall be provided in Appendix D. The SPO will be considered formally as part of the project plan for evaluation purposes, see Section 4.5 Technical Evaluation Criteria (AUG 1999).

The project schedule/milestone chart shall identify the period of performance for all tasks and subtasks. Budget periods, decision points, and deliverable dates should be clearly indicated on the chart. Specific/critical milestones and deliverables should be listed in an attached table. All deliverables (e.g., reports, devices, etc.) resulting from the work shall be identified.

The applicant shall provide a table listing the estimated labor hours and general labor categories (management, engineering, scientific, technician, clerical, etc.) required for each task. Key personnel should also be identified in this table. This must include all labor by team members, subcontractors and consultants and be specified by organization in the table. The applicant shall briefly discuss the rationale used to develop estimates for labor hours, labor categories and subcontracted/consulting activities.

The recipient shall identify and describe all proposed travel. This must include all travel by team members, subcontractors and consultants. The purpose to the travel, the number of trips, origin and destination, trip duration and the number of personnel shall be included in the explanation.

The applicant shall identify any (significant) potential problems that could arise during the project that may prevent the project objectives from being met and discuss ways of mitigating these problems. The applicant shall also discuss plans for technology transfer.

## **3. Merit of the Technology (Criterion 3)**

The discussion should clearly describe how the technology to be developed will benefit the natural gas industry. This shall include a clear and concise cost/benefit analysis. The applicant shall describe the merit of the proposed technology or methodology in terms of anticipated performance and/or cost savings over existing technologies and describe how the technology is an improvement over currently available technologies or an established baseline.

The applicant shall discuss the potential for the proposed technology or methodology to be commercialized and/or incorporated into the natural gas industry. Applicants must discuss specifics as to how the technology will be

commercialized and/or incorporated into the natural gas industry, including commercialization partners or parties, and the time frame for which commercialization is expected to occur.

As a condition of award under this solicitation, applicants must agree that at least 75% of the direct labor cost for the project (including subcontractor labor) will be incurred in the United States, unless the applicant can demonstrate to the satisfaction of DOE that the United States economic interest will be better served through a greater percentage of the work performed outside the United States. For example, an applicant may provide evidence that expertise to develop a technology exists only outside the United States, but that ultimate commercialization of the technology will result in substantial benefits to the United States such as increased employment, increased production of the U.S. resources, etc.

Applicants shall provide a statement that demonstrates its agreement with the preceding condition, or provide a detailed argument otherwise.

#### **4. Personnel Qualifications, Project Organization and Experience, Facilities and Equipment (Criterion 4)**

The applicant shall provide the qualifications of all participating organizations and individuals, including subcontractors and consultants, to execute and manage the proposed effort. This should include:

- A description of the credentials, capabilities, and experience (technical and managerial) of the organizations involved in the work effort.
- The credentials, capabilities, experience (technical and managerial) and availability of the key personnel to be assigned to the project. The roles of key personnel and the percentage of time being devoted to the project should be clearly identified. Resumes of key project personnel shall be included in Appendix B.
- A description of the project organization and structure, responsibilities and lines of authority, both technical and administrative, of the participating organizations and key personnel as they relate to the tasks and subtasks in the Statement of Project Objectives.
- A description of any prior experience in managing projects of similar type, size and complexity.
- A description of the type, quality, availability and appropriateness of facilities, equipment, and materials to be utilized in carrying out the proposed work.

### **3.6 INSTRUCTIONS FOR PREPARING THE STATEMENT OF PROJECT OBJECTIVES (SEPT 2000)**

All applications must contain a single, detailed Statement of Project Objectives that addresses how the project objectives will be met. The Statement of Project Objectives must contain a clear, concise description of all activities to be completed during project performance and follow the structure discussed below.

Applicants shall prepare the Statement of Project Objectives in the following format:

#### **TITLE OF WORK TO BE PERFORMED**

(Insert title of work to be performed. Be concise and descriptive.)

#### **A. OBJECTIVES**

Include one paragraph on the overall objective(s) of the work. Also, include objective(s) for each phase of the work.

#### **B. SCOPE OF WORK**

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work for each Phase.

## C. TASKS TO BE PERFORMED

Tasks, concisely written, should be provided in a logical sequence and should be divided into the phases of the project. This section provides a detailed description of the planned approach to this project. However, it should only contain a description of what work is planned, i.e., no technology descriptions or explanations of why work is planned should be provided here.

### PHASE I

Task 1.0 - (Title)

(Description)

Subtask 1.1 (Optional)

(Description)

Task 2.0 - (Title)

### PHASE II (Optional)

Task 3.0 - (Title)

## D. DELIVERABLES

The periodic, topical, and final reports shall be submitted in accordance with the attached “Federal Assistance Reporting Checklist” and the instructions accompanying the checklist.

The Recipient shall provide a list of deliverables other than those identified on the “Federal Assistance Reporting Checklist” that will be delivered. These reports shall also be identified within the text of the Statement of Project Objectives.

1. Task 1.1 - (Report Description)
2. Task 2.2 - (Report Description)

## E. BRIEFINGS/TECHNICAL PRESENTATIONS (If applicable)

The Recipient shall prepare detailed briefings for presentation to the COR at the COR’s facility located in Pittsburgh, PA or Morgantown, WV. Briefings shall be given by the Recipient to explain the plans, progress, and results of the technical effort. At a minimum, the Recipient shall include a project kickoff briefing and a final project review briefing. For costing purposes, the Recipient shall consider these briefings to be held at NETL’s Morgantown, WV office site.

## **SECTION IV -EVALUATION AND SELECTION**

### **4.1 INTRODUCTION (MAY 2000)**

This section contains the evaluation approach as well as the individual criteria to be used in the evaluation of applications.

### **4.2 GENERAL (JULY 1999)**

It is the policy of DOE that any financial assistance be awarded through a merit-based selection process which means a thorough, consistent and independent examination of applications based on pre-established criteria by persons knowledgeable in the field of the proposed project.

### **4.3 PRELIMINARY REVIEW (FEB 2001)**

Prior to a comprehensive evaluation, applications will undergo an initial review to determine whether the information required by the solicitation has been submitted and is properly completed. Applications will be reviewed for relevance to the Natural Gas E&P program and for responsiveness to the requirements of the solicitation. Solicitations that require cost-sharing will be reviewed to insure that this requirement has been met. Volume I of the application will be reviewed to assess the Applicant's eligibility under the lobbying, EPAct and Simpson-Craig Amendment requirements. Failure to successfully meet any one of these preliminary review criteria may result in the elimination of the application and no further consideration in the Comprehensive Evaluation. In the event that an application is eliminated, a notice will be sent to the Applicant stating the reason(s) that the application will not be considered for financial assistance under this solicitation.

### **4.4 COMPREHENSIVE EVALUATION (AUG 1999)**

Applications passing the preliminary evaluation shall be subject to a comprehensive evaluation in accordance with the technical evaluation criteria listed in this section.

The technical evaluation is conducted to determine the merits of the technical application with regard to the potential success of the project as well as future commercial applications. Comprehensive evaluation results in a numerical score for each application against each of the technical evaluation criteria.

The Environmental, Health, Safety, and Security (EHSS) Evaluation, which is not point scored, is conducted to determine the completeness of the Environmental Questionnaire, and to assess the applicant's awareness of EHSS requirements for mitigating project related EHSS risks and impacts.

The cost evaluation, which is not point scored, is conducted to determine the completeness of the cost estimate, appropriateness and reasonableness of the cost, and to assess the applicant's understanding of the Statement of Project Objectives.

### **4.5 TECHNICAL EVALUATION CRITERIA (AUG 1999)**

Technical applications submitted in response to this solicitation will be evaluated and scored in accordance with the criteria listed below:

(a) Criterion 1: Scientific and Technical Merit (30%)

Soundness of both the technology and technical approach based on accepted scientific and engineering principles. Understanding of the needs of the Natural Gas Exploration and Production (E&P) Industry and the need for the proposed technology. Current status of this or similar technologies that indicate the need for this technology, the likelihood for success of the proposed project, and how the proposed work comprises the next logical steps in R&D. Potential for success, from a technical viewpoint, in meeting the needs of the Natural Gas E&P industry and fulfilling the requirements of the Program Solicitation.

(b) Criterion 2: Project Plan/Technical Approach (30%)

Adequacy, appropriateness and completeness of the work to be performed to meet the project objectives. Logic of the Statement of Project Objectives (SPO), including the breakdown of tasks and subtasks to complete the proposed work and the need for the individual tasks and subtasks. Adequacy and appropriateness of the project schedule and milestones. Rationale and appropriateness of the proposed project site. Adequacy and appropriateness of proposed staffing levels and labor distribution (categories) for the specified tasks and subtasks, including all subcontractors and consultants. Appropriateness and necessity for the proposed travel.

(c) Criterion 3: Merit of the Technology (20%)

Merit of the technology or methodology in terms of anticipated performance improvements and/or cost savings over existing technologies. Adequacy, appropriateness and completeness of the cost/benefit analysis. Potential for the technology to be commercialized and/or incorporated into the natural gas industry. Appropriateness of the time frame for commercialization and/or incorporation into the natural gas industry. Potential economic benefit to the United States including the performance of the work in the United States.

(d) Criterion 4: Personnel Qualifications, Project Organization and Experience, Facilities and Equipment (20%)

Qualifications and relevant experience of the applicants organization and key technical and management personnel to be assigned to the project. Qualifications and demonstrated experience of the organization and its personnel to develop, manage and execute research and development projects of similar type, technology, size and complexity. Availability and degree of involvement of key technical and management personnel. Qualifications and experience of each proposed subcontractor or consultant to conduct the work that they are proposed to perform. Clarity and logic of the project organization and management structure with respect to responsibilities and authorities of all project participants. Demonstrated involvement of both a technology developer and a potential manufacturer/implementer of the technology to be developed. Suitability of type, adequacy of quality, availability and appropriateness of the proposed equipment, materials and supplies. Rationale for any proposed property to be furnished by the government.

#### **4.6 COST EVALUATION CRITERIA (JULY 1999)**

The costs proposed will be evaluated in response to this solicitation in order to:

- (a) determine the level of verifiable cost sharing;
- (b) ensure that all work elements included in the Statement of Project Objectives have associated costs, and that those cost appear appropriate and reasonable for the effort proposed; and
- (c) assess the applicant's understanding of the Statement of Project Objectives.

#### **4.7 RELATIVE ORDER OF IMPORTANCE OF EVALUATION CRITERIA (NOV 2000)**

The evaluation of the technical application will be conducted using preestablished weights to determine the relative merits of the application in accordance with the technical evaluation criteria. The technical evaluation (Volume II - Technical Application) represents 100% of the total evaluation scoring. Although Volume I and Volume III will not be point scored they will be considered in the selection decision and must be addressed.

The following weighting factors will be applied to each technical evaluation criteria to obtain a final evaluation rating for each application.

Scientific and Technical Merit	30%
Project Plan/Technical Approach	30%
Merit of the Technology	20%
Personnel Qualifications, Project Organization and Experience, Facilities and Equipment	20%
TOTAL - Technical Evaluation Factors	100%

#### **4.8 APPLICATION OF PROGRAM POLICY FACTORS (NOV 2000)**

These factors, while not indicators of the Application's merit, e.g., technical excellence, cost, proposer's ability, etc., may be essential to the process of selecting the application(s) that, individually or collectively, will best achieve the program objectives. Such factors are often beyond the control of the Applicant. Applicants should recognize that some very good applications may not receive an award because they do not fit within a mix of projects which maximizes the probability of achieving the DOE's overall research and development objectives. Therefore, the following Program Policy Factors may be used by the Source Selection Authority (SSA) to assist in determining which of the ranked application(s) shall receive DOE funding support.

1. It may be desirable to select a project(s) for award of less technical merit than another project(s), if such a selection will optimize use of available funds by allowing more projects to be supported while not being detrimental to the overall objectives of the program.
2. It is desirable to select for award a group of projects which represents a diversity of technical approaches and methods.
3. It may be desirable to support complementary and/or duplicative efforts or projects, which, when taken together, will best achieve the research goals and objectives.
4. It is desirable that different kinds and sizes of organizations be selected for award in order to provide a balanced programmatic effort and a variety of different technical perspectives.
5. It is desirable, because of the nature of the energy source, the type of projects envisioned, or limitations of past efforts, to select for award a group of projects with a broad or specific geographic distribution.

The above factors will be independently considered by the SSA in determining the optimum mix of applications that will be selected for support. These policy factors will provide the SSA with the capability of developing, from the competitive solicitation, a broad involvement of organizations and organizational ideas, which both enhance the overall technology research effort and upgrade the program content to meet the goals of the DOE.

#### **4.9 BASIS FOR SELECTION AND AWARD (MAY 2000)**

The Department of Energy anticipates the award of one or more financial assistance instruments to those applicants whose applications are determined to be in the best interest of the Department in achieving the program objectives set forth in this solicitation. Selection of an application by the Department will be achieved through a process of evaluating and comparing

the relative merits of the applicant's complete applications, in accordance with all of the evaluation factors set forth in this section.

This process reflects the Department's desire to accept an application based on its potential in best achieving program objectives, rather than solely on evaluated technical merit or cost. Accordingly, the Department of Energy may select for an award all, none, or any number or part, of an application, based on its decision as to which meritorious applications best achieve the program objectives set forth in this solicitation.

It is important for applicants to note that selection for negotiations will be made entirely on the basis of applications submitted. Applications should, therefore, address specifically the factors mentioned in the evaluation criteria, and not depend upon reviewers' background knowledge.